

FILE

28

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

BRIAN TOMLIN,

COMPLAINANT,

VS

CASE NO. 02-0046-EL-CSS

COLUMBUS SOUTHERN POWER
COMPANY AND AMERICAN
ELECTRIC POWER COMPANY, INC.,

RESPONDENTS.

CONNIE TOMLIN, INDIVIDUALLY:

AND

CONNIE TOMLIN, AS THE ADMINISTRATRIX OF
THE ESTATE OF GARY TOMLIN, DECEASED,

COMPLAINANT,

VS

CASE NO. 02-0066-EL-CSS

COLUMBUS SOUTHERN POWER
COMPANY AND AMERICAN
ELECTRIC POWER COMPANY, INC.

RESPONDENTS

DIRECT TESTIMONY
OF
J. DERALD MORGAN, PH.D.
on behalf of
COLUMBUS SOUTHERN POWER COMPANY

DATED: July 10, 2002

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PUCO

1 Q. PLEASE STATE YOUR NAME AND ADDRESS.

2
3 A. My name is J. Derald Morgan, Ph.D. My address is 113 Lansdowne Drive, Madison,
4 Alabama, 35758.

5
6 Q. BY WHOM ARE YOU CURRENTLY EMPLOYED AND IN WHAT POSITION?

7
8 A. I am the Vice President of the University of Alabama in Huntsville.

9
10
11 Q. WOULD YOU PLEASE BRIEFLY OUTLINE YOUR EDUCATIONAL
12 BACKGROUND.

13
14 A. I have a Bachelor of Science in Electrical Engineering from Louisiana Tech University,
15 received in 1962. In 1965, I received my Masters degree in electrical engineering from the University
16 of Missouri -- Rolla. In 1968, I received my Ph.D. in electrical engineering from Arizona State
17 University.

18
19 Q. PLEASE TELL US ABOUT YOUR WORK EXPERIENCE.

20
21 A. I have worked in the electrical power generation, transmission, distribution and utilization
22 field for over 40 years as an engineer, consultant, teacher and author. My detailed experience in
23 academia and industry is described in the resume, attached as Exhibit A.

24
25 Q. IS EXHIBIT A, ATTACHED HERETO, A TRUE AND ACCURATE COPY OF
26 YOUR RESUME?

27
28 A. Yes it is.

29
30
31 Q. DO YOU HOLD YOURSELF OUT AS AN EXPERT WITH RESPECT TO THE
32 NATIONAL ELECTRIC SAFETY CODE?

33
34 A. Yes I do.

35
36 Q. WHAT IS THE BASIS OF YOUR EXPERTISE IN THAT AREA?

37

1 A. The basis of my expertise is my 3 degrees in electrical engineering, my work as an engineer
2 where I daily used the National Electric Safety Code (NESC) and the National Electric Code (NEC),
3 my work as a consultant where I designed distribution systems using the NESC and also my
4 appearances as a trial witness and as an expert before Public Service Commissions. I have taught the
5 NESC and the NEC as a part of my academic career and my experience in teaching lineman work
6 practices for the Missouri Rural Electric Cooperatives.

7
8 **Q. WHEN WERE YOU RETAINED BY COLUMBUS SOUTHERN POWER**
9 **COMPANY IN CONNECTION WITH THIS MATTER?**

10
11 A. On June 20, 2002.

12
13
14 **Q. WHAT HAVE YOU REVIEWED IN CONNECTION WITH THIS MATTER IN**
15 **THE PROCESS OF COMING TO YOUR OPINIONS WHICH YOU INTEND TO**
16 **EXPRESS IN THIS MATTER?**

17
18 A. I have reviewed the transcripts of the depositions of Brian Tomlin, Eddie Moore, Danny
19 Downs, Roger Whaley, Robert Peters and Richard Buchanan. I have reviewed the two PUCO
20 complaints filed by Brian Tomlin and Connie Tomlin respectively. I have reviewed various accident
21 investigation materials including measurements taken at the scene by Caroline Irion and others,
22 drawings prepared by Caroline Irion based on those measurements and various photographs of the
23 accident scene, the accident combine and the accident crossarm. In addition I have reviewed the
24 various editions of the National Bureau of Standards Handbook, NESC, the official interpretations
25 of the NESC and the NESC Handbook Editions 4 and 5. I have looked into the wood pole
26 inspection practices of the US Bureau of Reclamation as well as the Rural Electric Cooperative
27 (REC) association and other electric utilities. I have searched the Wood Preservatives Institute web
28 page and materials available from them for public consumption related to life of wood structures
29 and crossarms.

30

1 Q. BASED UPON YOUR REVIEW OF THESE MATERIALS, DO YOU HAVE AN
2 UNDERSTANDING AS TO WHEN THE ACCIDENT CROSSARM WAS FIRST
3 INSTALLED?

4
5 A. Yes. It is my understanding that it was installed in or about 1958.
6
7

8 Q. WHAT VERSION OF THE NATIONAL ELECTRIC SAFETY CODE ("NESC")
9 WAS IN EFFECT IN 1958?

10
11 A. At that time the 1949 National Bureau of Standards Handbook H 43 ("USNBS 1949
12 Handbook H43") was in effect. This Handbook incorporated, among other things, the 1941 NESC
13 and, therefore, it would also be proper to state that the 1941 NESC was in effect in 1958.
14

15 Q. DID THE NATIONAL BUREAU OF STANDARDS HANDBOOK H 43, WHICH
16 CONTAINS THE 1941 NESC, INCLUDE A PROVISION REQUIRING THAT AN
17 ELECTRIC LINE BE ANY PARTICULAR HEIGHT AS IT PASSED OVER FARM
18 LAND AND, IF SO, WHAT WAS THAT REQUIRED HEIGHT?

19
20 A. No, there was no prescribed height for electric lines over cultivated fields at that time.
21
22

23 Q. DO YOU KNOW WHEN THE NESC FIRST PRESCRIBED A CERTAIN
24 HEIGHT FOR ELECTRIC LINES OVER CULTIVATED FARM FIELDS AND, IF SO,
25 WHICH VERSION OF THE NESC WAS IT?

26
27 A. Yes, it was the 1977 version of the NESC.
28
29

30 Q. DO YOU HAVE AN OPINION AS TO WHICH VERSION OF THE NESC
31 WOULD APPLY IN DETERMINING THE REQUIRED HEIGHT OF A LINE
32 INSTALLED IN OR ABOUT 1958 IN RELATION TO AN ACCIDENT INVOLVING
33 THAT ELECTRIC LINE WHICH OCCURRED ON OCTOBER 7, 1999?

34
35 A. Yes.
36
37

38 Q. WHICH VERSION OF THE NESC WOULD APPLY AND WHAT IS THE BASIS
39 OF YOUR OPINION IN THAT REGARD?

40
41 A. The 1949 Edition of the USNBS Handbook H43, or in other words the 1941 NESC, would
42 apply. In this edition there was no prescribed height requirement for this line passing over a
43 cultivated field. This opinion is based on a reading of the code, and the interpretation of the code IR

1 121 of January 31, 1965 and March 28, 1966 wherein the interpretation clearly reaffirms that no
2 clearance requirement is given or implied for cultivated fields. The NESC handbook also reaffirms
3 that there was no given required height. This category was added in the 1977 code wherein a
4 category for cultivated, grazing and orchards was added specifically to deal with the issues of
5 clearance.

6
7 Q. ARE YOU FAMILIAR WITH THE HISTORY OF THE VERTICAL
8 CLEARANCE REQUIREMENT OVER FARM FIELDS AND, IF SO, CAN YOU TRACE
9 THAT FOR US?

10
11 A. Yes. As previously stated, the USNBS Handbook H43 did not contain a vertical clearance
12 requirement for such a line. The first version of the NESC to contain such a requirement was
13 NESC 1977, which required a 20 foot clearance. In NESC 1990, the requirement became 18½ feet
14 but again, this would not apply to a line which was constructed in 1958 because the NESC makes
15 clear, most recently in NESC 2002, Rule 013 Part B, Existing Installations, Subpart 2, that "existing
16 installations, including maintenance replacements, that currently comply with prior editions of the
17 Code, need not be modified to comply with these rules except as may be required for safety reasons
18 by the administrative authority." Therefore it is clear in 2002 that only those installations that are
19 new or reconstructed need to meet the most recent edition of the NESC. It is further clear that
20 maintenance replacements do not constitute new construction. This has been the practice of the
21 utilities and the governing authorities from the very beginning of the Code up until the present.

22
23 Q. WHAT IS YOUR UNDERSTANDING OF THE HEIGHT OF THE ELECTRIC
24 LINE INVOLVED IN THIS INCIDENT AT THE TIME THE INCIDENT
25 OCCURRED?

26
27 A. Based upon my review of the deposition testimony, as well as Ms. Irion's drawings and
28 measurements she made, it appears that the line was as low as a couple feet from the ground at its

1 lowest point and that it was approximately 14 feet high at the point where the top of the grain bin
2 extender on the combine contacted the line.

3
4 Q. IF WE ASSUME THAT THERE WAS A VERTICAL HEIGHT REQUIREMENT
5 OF 18½ FEET AT THE TIME OF THE ACCIDENT, WHICH YOU SAID THERE WAS
6 NOT, IN YOUR OPINION DOES THE FACT THAT THE ELECTRIC LINE WAS
7 BELOW THIS ASSUMED REQUIRED HEIGHT FOR ELECTRIC LINES ACROSS
8 FARM LAND AT THE TIME OF THE ACCIDENT CONSTITUTE A VIOLATION OF
9 THE NESC?

10
11 A. No it does not.

12
13
14 Q. WHY NOT?

15
16 A. Neither the USNBS Handbook nor the NESC were intended to apply to sudden
17 catastrophic failures of an electric line caused by weather conditions or mechanical problems and
18 failures of equipment. The codes address the issue of failures of equipment by requiring that each
19 responsible utility inspect its equipment in order to operate a safe system. The code suggests that
20 because of the variation of weather and environment that it is impossible to specify a given required
21 inspection schedule or method. The determination is left to the utility based on its experience. The
22 5th edition of the NESC Handbook p 167 states that the language concerning inspection was
23 modified in the later codes, as it was not intended that specific schedules be met but rather that
24 experience of the utility at that location would be the controlling concept. The handbook further
25 states that inspections may be made while doing other duties and work. This "inspection while doing
26 other duties" standard was employed by Columbus Southern Power as delineated in the depositions
27 of Danny Downs and Roger Whaley, taken in the State Court proceedings. The code is silent on the
28 utilities responsibilities when unanticipated equipment failures occur but reason suggests that such
29 failures, in and of themselves, are not evidence of code violations in the construction and
30 maintenance of the system.

31

1 Q. WHEN IS THE VERTICAL CLEARANCE REQUIREMENT SET FORTH IN
2 LATER VERSIONS OF THE NESC INTENDED TO APPLY?

3
4 A. It is intended to apply at the time of construction such that if a line were installed at a height
5 lower than the required height , it would be a violation. It is also intended to apply to an ongoing,
6 uncorrected situation of which the utility is aware, such as where there is sag in the line causing the
7 height of the line to be less than the prescribed height. But again, in this instance, since the
8 construction occurred in 1958, under the applicable USNBS 1949 Handbook H 43, there was no
9 applicable height requirement.

10
11 Q. ARE YOU FAMILIAR WITH THE REQUIRED STRENGTH FACTORS FOR
12 WOODEN STRUCTURES, SUCH AS CROSSARMS, SET FORTH IN TABLE 261-1A OF
13 THE 1997 NESC?

14
15 A. Yes I am.

16
17
18 Q. WAS THERE SUCH A PROVISION CONTAINED IN THE USNBS 1949
19 HANDBOOK H 43?

20
21 A. No.

22
23
24 Q. IS IT THE USNBS 1949 HANDBOOK H 43 OR SOME LATER EDITION OF
25 THE CODE WHICH WOULD APPLY TO THE QUESTION OF THE STRENGTH OF
26 THE ACCIDENT CROSSARM?

27
28 A. USNBS 1949 Handbook H 43, or in other words, the 1941 NESC would apply.

29
30
31 Q. WHAT DOES THE USNBS 1949 HANDBOOK H 43 PROVIDE IN RELATION
32 TO THE REQUIRED STRENGTH OF THE CROSSARM?

33
34 A. Section 261 Grades B and C Construction Part D Crossarms provides guidance for the
35 loading of cross arms during the initial construction of the lines and states that crossarms with 2-4
36 pins shall be selected as yellow pine or fir of dimensions not less than 3"x 4". No where does the
37 Code give any indication as to how this crossarm strength is to be evaluated as the cross arm ages

1 and a loss of strength may occur. The sizing of the material and the selection of the type of material
2 were intended to provide good service with a margin of safety.

3
4 Q. DOES THE 1997 NESC, OR ANY OTHER VERSION OF THE NESC, SPECIFY
5 HOW THE STRENGTH OF THE CROSSARM IS TO BE MEASURED OVER TIME?

6
7 A. No it does not.

8
9 Q. ARE YOU FAMILIAR WITH THE INDUSTRY STANDARD WITH RESPECT
10 TO THE INSPECTION OF CROSSARMS?

11
12 A. Yes.

13
14
15 Q. WHAT IS THE INDUSTRY STANDARD?

16
17 A. There is not a set number of years between inspections of wood structures in the industry,
18 but rather a range of years that are used by various systems. For example, the US Bureau of
19 Reclamation uses a cycle that varies depending on the wood material in place that ranges from 12 to
20 15 years/cycle, the AEP standard is 15 years first inspection and 10 years thereafter. The industry
21 standard for crossarms parallels the inspection cycle for poles and is done at the time of pole
22 inspection from the ground. Crossarms also lend themselves to inspections while doing other
23 duties. Warping, tilting and shifting of the crossarms may be observed during driving and working.

24
25 Q. ASSUMING ARGUENDO THAT TABLE 261-1A OF THE 1997 CODE WERE
26 APPLICABLE, IS THERE ANY SCIENTIFIC WAY TO DETERMINE WHETHER
27 THE REQUIREMENTS OF TABLE 261-1A ARE MET BY DOING A VISUAL
28 INSPECTION FROM THE GROUND?

29
30 A. No there is not. Normally if the pole at the ground line is sound it is expected that the
31 crossarm will also retain its strength unless visibly damaged by lightning, woodpeckers, bees or other
32 insects. The inspection would include damaged or failed bracing, excessive checking, cracking or
33 splitting or other obvious defects like those associated with change in shape.

34

1 Q. DO YOU HAVE AN OPINION AS TO WHETHER THIS CROSSARM MET
2 THE STRENGTH STANDARD SET FORTH IN TABLE 261-1A AT THE TIME THE
3 INSULATOR SEPARATED FROM THE CROSSARM, PRIOR TO THE ACCIDENT
4 INVOLVING THE COMBINE AND, IF SO, WHAT IS THAT OPINION?
5

6 A. I have not had the opportunity to personally inspect the subject crossarm. I intend to do so
7 before the hearing but in light of the short time frame for preparation of this material such an
8 inspection has not been made as of this date. However, it should be noted that the strength
9 requirements of the current table were not in place at the time of construction of this line. It should
10 also be noted that according to the American Wood Preservatives Institute that a preserved wood
11 structure could be expected to give good service for up to 75 years. There is no specific reason to
12 expect that this subject crossarm would not also give this service based on the experience of
13 Columbus Southern and other utilities. Further the arm held the floater that had occurred from a pin
14 or insulator failure at an adjacent pole a short time before this incident. No problems were seen with
15 this crossarm during the visual inspection made at the time that floater was repaired. However,
16 again it must be stressed that this strength requirement was not in effect at the time this crossarm
17 was installed and, therefore, this crossarm was not required to meet this requirement.

18
19 Q. HAVE YOU REVIEWED THE SWORN TESTIMONY OF MR. DANNY DOWNS
20 AND MR. ROGER WHALEY CONCERNING THE REPAIRS THEY PERFORMED AT
21 AN ADJACENT POLE AND CROSSARM IN OR ABOUT 1995 OR 1996?
22

23 A. Yes I have.
24
25

26 Q. WHAT IS YOUR UNDERSTANDING OF THAT INCIDENT AND THE
27 REPAIRS WHICH THEY MADE?
28

29 A. That incident involved a "floater" one pole away from the one which was involved in the
30 Tomlin incident. Mr. Downs and Mr. Whaley replaced the old insulator with a new insulator and
31 used the same crossarm but used the next pre-drilled hole because of some burn damage to the
32 bottom of the end of the crossarm caused by contact with the floating wire which had become

1 disconnected from the insulator and, through expansion and contraction of the line as occurs
2 through changes in temperature, had gotten down below the crossarm.

3
4 Q. IS THERE ANY SIGNIFICANCE IN RELATION TO THAT INCIDENT IN
5 TERMS OF DETERMINING WHETHER THE WOOD CROSSARM WAS THEN IN
6 COMPLIANCE WITH THE STRENGTH REQUIREMENT SET FORTH IN THE 1997
7 NESC?

8
9 A. Yes, in my opinion the subject crossarm met or surpassed the strength requirement at that
10 time because it held the insulator in place despite the fact that it had extra weight and extra lateral
11 force being applied to it as a result of the fact that the line was not being held in its proper position
12 one pole away.

13
14 Q. IS IT POSSIBLE FOR YOU OR ANYONE TO SAY WHETHER, AND WHEN,
15 THE CROSSARM STOPPED MEETING THE NESC STRENGTH REQUIREMENT?

16
17 A. No.

18
19 Q. BASED UPON YOUR EDUCATION AND EXPERIENCE, IS THERE AN
20 ESTABLISHED "LIFE SPAN" OR "LIFE EXPECTANCY" FOR UTILITY POLES
21 AND/OR CROSSARMS?

22
23 A. No, but both can be expected to give good service for 75 years. Indeed, experience shows
24 that crossarms last longer than the poles because they are up in the air away from the moisture in the
25 ground, away from insects, etc. That is why poles are typically inspected every 10-15 years for rot by
26 actually probing the pole to check for rot whereas the crossarms are typically inspected visually from
27 the ground. The conventional wisdom is, and has always been, that if you inspect a pole and it is
28 satisfactory, the crossarm which would typically be of the same or more recent vintage, should be
29 satisfactory too.

30
31 Q. ARE YOU FAMILIAR WITH WHAT INSPECTIONS HAVE BEEN DONE OF
32 THE POLE AND CROSSARM INVOLVED IN THE TOMLIN ACCIDENT AND, IF
33 SO, OUTLINE FOR US YOUR UNDERSTANDING OF THOSE INSPECTIONS?

34

1 A. I have seen a picture of the subject pole bearing a 1979 pole treatment tag. Such an
2 inspection and treatment of the pole typically involves a visual inspection of the crossarm from the
3 ground. I have also seen a record concerning a 2002 pole inspection and treatment indicating that
4 the pole passed the inspection and is still in service. The pole may have been inspected between
5 1979 and 2002, however, I have not seen records of any other inspection of this pole. Nevertheless,
6 since the pole passed a 2002 inspection, there is no logical reason to think it would not have passed
7 an inspection conducted 10 or 15 years earlier. I am also aware of the inspection performed by Mr.
8 Downs and Mr. Whaley outlined above. Additionally, it is my understanding that additional
9 inspections may well have occurred, however, there are no records of these inspections.

10
11 Q. HAVE YOU SEEN INFORMATION INDICATING HOW OLD THE
12 ACCIDENT POLE IS?

13
14 A. Yes, the records indicate it was installed in 1930.
15
16

17 Q. ARE YOU FAMILIAR WITH THE PROVISIONS SET FORTH IN THE NESC
18 AS IT EXISTED IN OCTOBER, 1999, OR AT ANY TIME PRIOR TO THAT,
19 PERTAINING TO THE FREQUENCY AND THE NATURE OF THE INSPECTIONS
20 WHICH ARE TO BE PERFORMED ON DISTRIBUTION LINES INCLUDING
21 CROSSARMS?

22
23 A. Yes.
24
25

26 Q. WHAT DOES THE NESC PROVIDE?

27
28 A. It does not require inspections at any particular time interval and does not specify how the
29 inspections are to be done. Furthermore, the NESC suggests that utility employees, as they go
30 about their regular duties in their regular territories, can perform inspections of the equipment on a
31 regular basis. This is, for example, consistent with Mr. Downs and Mr. Whaley performing their
32 inspection of this pole and crossarm when they were there to do work one pole away. As I
33 understand it, the Ohio PUCO has recently adopted some additional inspection requirements.

1 However, in 1999 the NESC did not contain any such specific inspection requirements, and it still
2 does not contain any such requirements today.

3
4 Q. ARE YOU FAMILIAR WITH THE RECORD-KEEPING REQUIREMENTS, IF
5 ANY, UNDER THE NESC IN RELATION TO MAINTENANCE AND INSPECTION
6 WORK AND, IF SO, WOULD YOU PLEASE OUTLINE THE RECORD KEEPING
7 PROVISIONS.

8
9 A. Yes I am familiar with the NESC provisions in this area. The NESC requires only that
10 written records of needed repairs be kept, and that they must be kept only until such time as the
11 needed work is completed. There is no requirement that records be kept indicating no work is
12 necessary or that records which are created of repairs which are needed be kept after the repairs are
13 made.

14 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY IN THIS MATTER?

15
16 A. Yes it does.

JOHN DERALD MORGAN

Date of Birth: March 15, 1939
Place of Birth: Hays, Kansas
Office Address: Vice President
Alumni House 102, UAH
Huntsville, AL 35899
Home Address:
113 Lansdowne Dr.
Madison, AL 35758

Marital Status: Married - Wife: Elizabeth June
Children: Laura Elizabeth (1965)
Kimberly Ann (1968)
Rebecca Ruth (1972)
John Derald, Jr. (1978)

PROFESSIONAL DATA:

Degrees: B.S.E.E., Louisiana Tech University - 1962
M.S.E.E., University of Missouri-Rolla - 1965
Ph.D., Arizona State University - 1968
Electrical Engineer, University of Missouri-Rolla - 1987

Thesis Titles: M.S., "Analog Simulation of a Synchronous Machine"
Ph.D., "Methods of Determining Power System Stability Using the
Theorems of Liapunov"

ACADEMIC EXPERIENCE:

1999- Present Vice Pres. of Univ. Advancement, Univ. of Alabama in Huntsville
1999- Present Executive Director of University of Alabama Huntsville Foundation
1985 - 1999 Dean, College of Engineering, New Mexico State University
1978 - 1985 Chair, Electrical Engineering Department, University of
Missouri-Rolla (UMR)
1976 - 1985 Emerson Electric Professor of Electrical Engineering, UMR
1975 - 1976 Professor of Electrical Engineering, UMR
1974 - 1978 Associate Director, Center for International Programs and Studies, UMR
1973 - 1975 Alcoa Foundation Professor, UMR
1972 - 1978 Power Area Coordinator, UMR Electrical Engineering 7/8/02
1971 - 1973 Assistant Director, Center for International Programs and Studies, UMR
1970 (Summer) Visiting Professor, Carnegie Mellon University
1970 (Summer) Visiting Professor, University of Pittsburgh
1968 - 1973 Associate Professor of Electrical Engineering, UMR
1965 - 1968 Instructor, Arizona State University
1963 - 1965 Instructor of Electrical Engineering, UMR

NON ACADEMIC EXPERIENCE

1977 Summer Emerson Electric, Pitman Division, Special Consultant
1976 Summer Black and Veatch, Kansas City, MO
1975 Summer Electric Power Research Institute, Palo Alto, CA
1972 Summer Westinghouse Electric Corporation, Pittsburgh, PA
1970 Summer Westinghouse Electric Corporation, Pittsburgh, PA
1969 Summer ASEE-NASA Summer Science Faculty Study, Langley, VA

1968 Summer	Arizona Public Service Co., Phoenix, AZ
1962 - 1963	Texas Eastman, Division of Eastman Kodak, Longview, TX
1961 Summer	Stadwerke Bremen, Germany
1960 Summer	Esso, Division of Humble Oil, Baton Rouge, LA
1959 Summer	Texas Instruments, Dallas, TX

PROFESSIONAL AFFILIATIONS

Institute of Electrical & Electronic Engineers-Fellow
 American Society for Engineering Education
 Registered Professional Engineer-Missouri and New Mexico
 National Society of Professional Engineers
 Alabama Society of Professional Engineers
 American Society for Testing Materials
 National Academy of Forensic Engineers-Fellow
 CESB Board Certified Diplomat in Forensic Engineering.

CURRENT PROFESSIONAL ACTIVITIES AND COMMITTEES:

Associate Editor, Electric Power Systems Research Journal
 ASTM D 09 Committee
 The Order of the Engineer - Board of Directors
 ASEE Bylaws Committee Chair
 Huntsville Leadership Class 13
 Huntsville Rotary Club

PAST PROFESSIONAL ACTIVITIES AND COMMITTEES:

NSPE - Membership Committee
 NSPE - National Director
 NSPE - PEE Chair
 NMSPE - Board of Directors
 NSPE - Vice Chair
 NSPE - PEE Membership Committee Chairman
 NSPE - Southwest Vice Chair PEE
 NSPE - Education Advisory Group
 NSPE - Education Foundation Financial Development
 NSPE - *Nomination Committee*
 Washington University, St. Louis, MO, External Advisory Committee for Engineering Research
 National Pollution Prevention Center - Advisory Board
 NASULGC - Technology Committee
 Coordinator and Host for the 27th ASEE National Engineering Deans' Institute
 Member, IEEE PES Power System Engineering Standards Committee
 Member, IEEE PES Educational Committee
 Member, Midwest Power Symposium Advisory Board (Vice President 1973 - 74)
 Chairman, IEEE International Practices Subcommittee
 Chairman, IEEE Educational Resources Subcommittee
 Secretary, IEEE Power Systems Engineering Committee
 Vice Chairman, IEEE Power Systems Engineering Committee
 Chairman, IEEE Power System Engineering Committee
 Technical Committee, U.S. National Committee, World Energy Conference
 Board of Directors, Missouri Partners of the Americas

Engineers' Club of St. Louis
 St. Louis Electrical Board of Trade
 Treasurer, Missouri Incuttech Foundation (Board of Directors - Founding Member)
 Member, Student Faculty Attendance Committee, American Power Conference
 Member, University and Society Representative Committee, American Power Conference
 Co-Chairman, Collegiate Committee, 1984 IEEE T&D Conference & Exposition
 Editorial Board, McMillan Publishers, Engineering Division
 Member, IEEE #4 Standards Committee on Dielectric Testing
 Co Author, IEEE Standard on Grounding During the Installation of Overhead Lines, P524A
 New Mexico Research and Development Institute -Member Technical Advisory Committee
 NSPE, New Mexico Governor PEE
 New Mexico Commission on Higher Education -Member ITV Committee
 New Mexico Engineering Foundation - Member Board of Directors
 New Mexico INC - Member Board of Directors
 Quatro - Member Board of Directors
 MESA - Member Board of Directors
 ASEE - Member Public Policy Committee
 EDC/NSPE - Member Task Force on Registration
 US West - Member Board of Directors NM

HONORS AND AWARDS:

Honors Societies:

Beta Club
 Tau Beta Pi
 Eta Kappa Nu
 Sigma Xi
 Phi Kappa Phi
 Omicron Delta Kappa

Boy Scouts of America Recognition

Scouters Award - 1969
 Scouters Key - 1971
 Award of Merit - 1976
 Silver Beaver - 1982
 Webelos Den Leader Award - 1990

Outstanding Freshman Engineering Student (Louisiana Tech)
 Outstanding Sophomore Electrical Engineering Student (Louisiana Tech)
 International Association for the Exchange of Students for Technical Experience - Sponsored by
 The Engineers Joint Council of America-1961
 Selected by the National Academy of Science to make a one-month scientific visitation to
 Romania-1971
 IEEE St. Louis Section Award of Honor - 1979
 IEEE St. Louis Section Education Award - 1983
 Region V IEEE Outstanding Member - 1984
 IEEE Centennial Medal - 1984
 Wizard of ID, University of Missouri-Rolla, EE HKN, 1984
 Elected Fellow IEEE - 1984
 Academy of Electrical Engineers - University of Missouri-Rolla - 1986
 President's Service Award - New Mexico State University - 1990
 NM Engineering Foundation, 1991-92 Distinguished Engineers Award
 NMSPE Engineer of the Year - 1993
 PSI Executive of the Year - 1993
 Paul Harris Fellow, Las Cruces Rotary Club - 1997

BIOGRAPHICAL LISTINGS:

Who's Who Among Students in American Colleges and Universities
 Who's Who in America
 American Men and Women of Science

Who's Who in Engineering
Outstanding Young Men of America
Community Leaders of America
Who's Who in Missouri Education
International Who's Who in Intellectuals
Notable Americans of the Bicentennial Era
Who's Who in the Midwest
Dictionary of International Biography
Men of Achievement
International Scholars Directory
The Best Lawyers in America: Directory of Expert Witnesses
A Century of Honors-IEEE 1984

SCHOLARSHIPS:

Kappa Sigma Scholarship Leadership Award
T. H. Harris Scholarship
John Horton Scholarship

TECHNICAL AREAS OF INTEREST:

Electrical Engineering; Power System Analysis, Planning and Control; High Voltage Engineering; Forensic Engineering; Manufacturing R&D and Economic Development; Technology Assessment; Environmental Monitoring and Systems; Alternative Energy Systems; Innovative Educational Methods and Systems

CONSULTING ACTIVITIES: (Selected)

General Cable Company	Black and Veatch
Pueblo Development	Emerson Electric Company
Westinghouse Electric Corporation	Pitman Manufacturing Company
Arizona Public Service	Skyhook
Union Electric Company	Little Giant
A. B. Chance Company	Kansas City P&L
Education Development Center	Missouri Public Service
Electric Power Research Institute	Arkansas P&L
FMC	Iowa Power
Midwest Footwear, Inc.	Hi-Ranger
Olympic Consultants	ALTEC
Mobil Oil Company	TECHLAN
Bucyrus-Erie	AMCA/Kochring
Kansas City Power and Light	Mobil Aerial Towers
Farm Industrial Equipment Institute	Fenix and Scisson
National Crane	Schwing
Grove Manufacturing, JLG, Inc.	Snorkel
American Electric Power	Harnischfeger
Altec	Telelect
Mr. Longarm	

SHORT COURSES AND CONFERENCES DIRECTED:

Director of five Underground Distribution Conferences and Workshops, held in Columbia and Springfield, Missouri and Overland Park, Kansas, 1973-1981.

Director, five UMR-MEC* Conferences on Energy held at the University of Missouri -Rolla, October 1975-1979. *Name changed to UMR/DNR Conference on Energy in 1977. Further

changed to UMR/DNR Conference and Exposition of Energy in 1978.

Director of 15 Power Apparatus Testing Techniques Short Courses held at the F. Gano Chance Laboratory, Centralia, Missouri, 1971 - 1985.

Director, four courses on Power Apparatus Testing Techniques held at the Universidade Federal de Minas Gerais Laboratory, Belo Horizonte, Brazil, 1974 and 1975.

Co-Director & Founder, Electric Lineman Program, Missouri Electric Cooperatives, 1981 - 1985.

Director/Host, 1990 National Engineering Deans' Institute

SERVICE CLUBS AND CIVIC ACTIVITIES:

1954 - 1957	Key Club
1959 - 1962	Circle K Club
1960 - 1961	Vice President
1961 - 1962	President
1985 - 1999	Rotary, Las Cruces Club
1991 - 1999	Project 2000 Task Force for Model Schools, Las Cruces, NM
1992- 1999	Aggie Sports Association Board of Directors
1999-	Huntsville Rotary Club

Boy Scouts of America

1962 - 1963	Asst. Scoutmaster, Troop 201, Longview, Texas
1963 - 1964	Asst. Scoutmaster, Troop 81, Rolla, Missouri
1964 - 1965	Scoutmaster, Troop 81, Rolla, Missouri
1965 - 1968	Institutional Representative, Troop 83, Tempe, Arizona
1968 - 1981	Cubmaster, Pack 81, Rolla, Missouri
1972 - 1973	Asst. District Commissioner, Big Piney District, BSA
1978 - 1980	Chairman, Meramec District, Rolla, Missouri (Founding Chairman)
1980 - 1985	Executive Committee, Ozark's Council
1985 - 1990	Cubmaster, Pack 61, Las Cruces, New Mexico
1989 - 1994	District Committee, Sunshine District
1990 - 1999	Assistant Scoutmaster, Troop 180, Troop 173
1995 -	BSA National Engineering and Technology Exploring Committee
1999-	Northern Alabama Council Boy Scouts of America
2000-	BSA Creek District Commissioner's Committee
2000-	BSA Creek District Chair Elect

United Methodist Church

1962 - 1963	Adult Leader, United Methodist Jr. High, Longview, Texas
1963 - 1965	Adult Leader, United Methodist Sr. High, Rolla, Missouri
1965 - 1966	Administrative Board, Tempe, Arizona
1966 - 1968	Administrative Board, Scottsdale, Arizona
1968 - 1971	Adult Leader, United Methodist Sr. High, Rolla, Missouri
1969 - 1975	Board of Trustees, Rolla, Missouri
1973 - 1975	President, Board of Trustees, Rolla, Missouri
1973 - 1975	Superintendent, United Methodist Church School
1975 - 1985	Board of Directors, United Ministries in Higher Education
1976 - 1978	Teacher, United Methodist Church School
1979 - 1981	Chairman, First United Methodist Church Administrative Board

1980 - 1981	Director - United Ministries in Higher Education Christian Technology Action Project.
1988 - 1990	Co-Director Assimilation Committee, St. Paul's UMC, Las Cruces, NM
1996 - 1999	Member and Chair Board of Trustees, St Paul's UMC, Las Cruces, NM
2000	Administrative Board and Finance Committee, UMC, Madison, AL

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From Sundancers to Space Exploration. Joint publication by the NM Academy of Science
and NM Sigma XI Chapter, 1986, pp. 166-181.

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in Engineering Education", ASEE Journal, Vol. 61, No. 7, Engineering Education, April
1971.

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Laboratory", Special Education Issue, IEEE Proceedings, June 1971.

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- Analytical and Experimental Results", 71TP-69, IEEE Transactions on Power Apparatus
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C. W. Glazer and J. D. Morgan, "Building Heating Cooling - Ventilation Energy Analysis Computer Program", American Power Conference Proceedings, April 1970.

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for Rural Electrification", 1972 Midwest Power Symposium Conference Proceedings, October 1972.

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DMR Gateway Energy Conference, St. Louis, MO, November 1983.

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G. P. Mulholland, J. D. Morgan, E. Hensel and L. Cox, "Advanced Manufacturing Center at New Mexico State University", presented at the FAIM '92 Conference, Falls Church, Virginia, June 30-July 2, 1992.

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R. Bhada and J. D. Morgan, "An Educational Program Leading to Practical Outreach Programs: A Case Study", presented at AWMA Meeting, Denver, CO, January 1993.

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R. Bhada, J. D. Morgan and A. Ghassemi, "Resources of the Future in Environmental Management", presented at WM-94, Laser Optics, Inc., October 1993.

R. Bhada, A. Ghassemi, R. Jacquez and J. D. Morgan, "Case Study: Academic/Government/Industry Partnerships for Technology Transfer", October - November 1993.

R. Bhada and J. D. Morgan, "Environmental Education and Technology Transfer Program", Budapest, November 1993.

R. K. Bhada, J. D. Morgan, R. Jacquez and A. Ghassemi, "Resources of the Future in Environmental Management", WM Symposia, Inc., March 2, 1994.

J. D. Morgan and J. Creed, "TQM and More", presented at The Third Engineering Director's & Dean's Conference, Boulder, CO, March 7, 1994.

J. D. Morgan, R. K. Bhada, A. Ghassemi, and R. B. Jacquez, "Advanced Technologies Demonstrated by the Waste-management Consortium of New Mexico", presented at the I&EC Special Symposium, Atlanta, GA, September 19-21, 1994.

R. K. Bhada, A. Ghassemi, and J. D. Morgan, "An Innovative Academic/Government/Industry Education & Economic Development Program", Fourth World Conference on Engineering Education Proceedings, 1995.

R. K. Bhada, A. Ghassemi and J. D. Morgan, "Dynamic Program for Education, Technology and Public Outreach", presented at the 1996 Conference on the Environment, March 12, 1996.

R. K. Bhada, A. Ghassemi and J. D. Morgan, "Enhanced Environmental Education-A Multi-dimensional Environmental Education Program", presented at the 89th Annual Meeting of the Air & Waste Management Association, Nashville, TN, June 23-28, 1996.

R. K. Bhada, A. Ghassemi and J. D. Morgan, "Engineering Education by An Application Oriented Design", 1996 ASEE Annual Conference Proceedings, Washington, DC, June 24-26, 1996.

R. K. Bhada, A. Ghassemi, J. D. Morgan and C. Perez, "The Waste-management Education & Research Consortium (WERC) Beyond the Formative Years", presented at the I&EC Special Symposium American Chemical Society, Birmingham, AL, September

9-11, 1996.

R. K. Bhada, C. Perez and J. D. Morgan, "A Multi-Dimensional Approach to Environmental Management", presented at the I&EC Special Symposium, American Chemical Society, Pittsburgh, PA, September 15-17, 1997.

D. Studies and Work Contributed to:

J. D. Morgan, et al., "Tellurian Resources Inventory and Development", ASEE-NASA 1969 Summer Study NASA Contract No. NSF-47-033-101.

J. D. Morgan, et al., "TRIAD Needs Analysis Supplement to the Final Report on a Preliminary Design of an Earth Resources Survey System", ASEE-NASA Summer Study, NASA Contract No. NSF-47-003-101.

J. D. Morgan, et al., D. O. Wiitanen, "Energizing Station Capacitor Bank Transients", UMR Research Report No. PRC-7001NW.

J. D. Morgan and S. K. Tandey, "A Method for Studying Sequential Faults on a Three Phase Distribution Transformer", UMR Research Report No. PRC-7101MP.

J. D. Morgan and R. S. Bhatia, "Magnetic Properties of Ceramic Ferrites Developed for Use in Fractional Horse Power A. C. Motors", UMR Research Report No. PRC-7102MB.

J. D. Morgan and J. V. Saavedra, "ALCOA Distribution System Load Flow Program", UMR Research Report No. PRC-7103MS.

J. D. Morgan and S. A. Khalifa, "ALCOA - Short Circuit Program for the IBM 360 System", UMR Research Report No. PRC-7201MK.

J. D. Morgan and G. McPherson, "A National Generator Research Program, Survey of Troubles and Causes Between 1969-1973", UMR Research Report No. PRC-7401MM.

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J. D. Morgan and G. McPherson, "1975 Report, A National Generator Research Program, Volume 1", UMR Research Report No. PRC-7601MM; Volume 11, UMR Research Report No. PRC-7602MM.

J. D. Morgan and J. F. Morris, "Health and Safety Study of the Union Electric 138 kV Crestwood Transmission Line", Report to the Missouri Public Service Commission, 1980.

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J. D. Morgan, "High Frequency Lighting", Louisiana Tech Engineer, 1961.

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"Geology and Hydrology Seminars, Brazil Project", CIPAS-USAID Grant, 1973-74, No. AID 12-721.

"Scientists and Engineers in Economic Development", NSF Grant No. GR-38042.

"Undergraduate Power Program Development", Westinghouse Educational Foundation Grant, 1973-1974.

"Transportation of Network Analyzer", Westinghouse Electric Corporation Grant, 1973.

"Network Analyzer", Wisconsin Electric Power Company Gift, 1973.

"Undergraduate Power Program Development", Illinois Power Company Grant, 1973-1978.

"A National Generator Research Program", Union Electric Company Grants, 1973-1975.

"U. S. /Romania Research Seminar - Current Research in Methods of Computer Analysis and Control of Power Systems", NSF Grant No. GF-39793, 1974.

"Undergraduate Power Program Development", Union Electric Grant, 1974-1979.

"Power Program Developments", General Electric Foundation Grant, 1975-1977.

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"Graduate Research Program", St. Joseph Light and Power Company, 1975-1979.

"Geology and Hydrology Seminars", CIPAS-USAID Contract, 1974-1975, No. AID 12-754.

"Power Laboratory Assistance Program", Escuela Superior Polytechnic del Litoral Grant.

"Power Program Development", Kansas City Power and Light Grant, 1975-1979.

"Forestry Seminar", CIPASI-USAID Contract, 1975-1976, No. AID 12-805.

"Missouri Department of Natural Resources", Energy Agency Grants, 1976 to 1979.

"Investigation of Basic Principles Involved in Ozone Production", Energy Industries, Inc. Grant 1978-1979.

"Missouri Utilities Fellowships", 1974-1980.

"Power Development Program", Wisconsin Power and Light Grant, 1975-1979.

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"Power Program Professorship", Emerson Electric Company, 1975-1985.

"Power Program Development", Missouri Public Service Company, 1977-1981.

"Petroleum Laboratory Development", Escuela Superior Polytechnic Del Litoral Grant, 1977.

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"Power Program Development", Westinghouse Electric Foundation, 1978-1980.

"Power Program Development", McGraw-Edison Company, 1977-1979.

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"Alcoa Plant Distribution System Load Flow Program", Davenport Study, 1971, Report No. PRC-7103MS; "Alcoa Plant Distribution System Short Circuit Program", Davenport Study, 1971-1972, Report No. PRC-7201 MK; "Master Data Bank for Distribution System Program", ALCOA 1973-1974, 1976 and 1977.

"Cycloconverter and Control Logic", Emerson Electric Company Grant, 1978.

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"H. V. Study and Load Management Study", Missouri Public Service Commission

"Fellowship Grant", Teledyne MEC, 1982-1983.

"Emerson Electric Machine and Drives Laboratory", Emerson Electric Co.

"High Voltage Laboratory Curriculum Development", Westinghouse Education Foundation,

"Study in Ferrorsonance in Airpark", Missouri Public Service Company, 1982.

"Electrical Engineering Professorship", Teledyne MEC, 1983-1986.

"Signal Processing Laboratory", McDonnell-Douglas, 1982.

"Schlumberger Professorship(s) in Electrical Engineering", 1984.

"Fred Finley Endowed Fellowship in Communications", 1984.

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THESIS SUPERVISION

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"Hybrid Solution of Power System Transients," S. W. Shaw, M. S., 1971.

"Unsymmetrical System Fault Analysis", S. K. Pandey, M.S., 1971.

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